Space Weather Forecast

Issued on Sunday 16 February 2025 at 01:14 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Geomagnetic Storms and R1/Minor Radio Blackouts.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has fallen to Low in the last 24 hours, with peak flare a Common-class flare at 15/1936UTC from a region beyond the western limb.

There are currently ten sunspot regions on the visible disc. One in the southeast, nearing centre disk, which has a large central asymmetric spot surrounded by peripheral spots, most of which are small, with signs of a tenuous delta perhaps developing near the central spot. The only other notable region is near the southeast limb, with a relatively long and perhaps increasingly complex nature gradually becoming evident . All other spots are relatively simple with only little changes observed.

A coronal mass ejection from a filament eruption in the northeast of the disc was observed at 15/0107 UTC.

Solar Wind / Geomagnetic Activity: Solar winds showed an ongoing connection to a fast wind, showing an overall rise from elevated levels to strong levels by the end of the period. The Interplanetary Magnetic Field showed a weakening trend from moderate to weak. The north-south component varied between weakly positive and moderately negative, but also on a weakening trend over time. The net result of the above solar wind measures was Unsettled to Active geomagnetic activity, with a peak of G1/Minor storm (Kp 5) for two intervals 15/0900-1159UTC and 15/2100-2359UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to moderate activity is expected with a chance of isolated Moderate-class flares,

Solar Wind / Geomagnetic Activity: Several faint coronal mass ejections from 14/15 Feb bring a chance of glancing impacts between day 1-3 (Feb 16–18), with a low risk of some of these coronal mass ejections merging.

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Coronal hole fast winds from CH14/- are elevated, and anticipated to remain relatively steady through day 1 (Feb 16), with a slow decline back to background by the end of day 3 or day 4 (Feb 18-19).

Predominantly Unsettled to Active geomagnetic conditions are expected throughout, with a chance of G1/Minor geomagnetic storm (Kp 5) intervals due to coronal hole influences or glancing CMEs. By the end of day 3 (18 Feb) solar wind speeds and current coronal mass ejection risks are expected to diminish, with geomagnetic activity falling back to Quiet to Unsettled levels (Kp 0-3).

Energetic Particles / Solar Radiation: There is a marginally increasing slight chance of a solar radiation storm S1 events given the westward progression of current active regions.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	40	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	50	50	50	50
Very Active	R3-R5 (X Class)	No	5	5	5	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	15
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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